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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/520,825	07/28/2005	Kim Tiow Ooi	1003.P013US/ADR/ay	2706
38556 7590 01/23/2008 LAWRENCE Y.D. HO & ASSOCIATES PTE LTD 30 BIDEFORD ROAD, #02-02, THONGSIA BUILDING SINGAPORE, 229922 SINGAPORE				
EXAMINER ITALIANO, ROCCO				
ART UNIT		PAPER NUMBER		
4156				
MAIL DATE		DELIVERY MODE		
01/23/2008		PAPER		

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/520,825

Applicant(s)

OOI ET AL.

Examiner

ROCCO ITALIANO

Art Unit

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 01/07/2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-21 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-21 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SF/ICE)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

Claim Rejections - 35 USC § 103

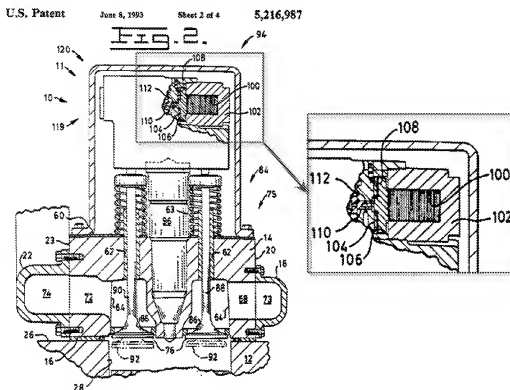
The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-2, 6-9, 13-16 and 20-21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Clarke U.S. 5,216,987 and further in view of Alexius U.S. 4,995,587.

Clarke discloses a piezoelectric motor (100) wherein its linear expansion is less than the linear displacement required to move a pair of valves (see column 5, lines 6 - 9). The piezoelectric motor, which is disclosed as being well-known in the art, is described as being able to linearly expand thru electrical excitation. Clarke further discloses that the piezoelectric motor is housed in a piezo-housing (102). Adjacent the piezo-housing 102 is a piston housing (104) in which are positioned a driver piston (108), an amplifier piston (110), and a fluid chamber (112) there between (see column 4, line 68 – column 5, line 5). Clarke outlines that the driver piston (108), amplifier piston (110) and fluid chamber (112) are provided to translate and amplify linear displacement of the piezoelectric motor (100). Clarke discloses, the amplifier piston (110) is sized much smaller than the driver piston (108) as the hydraulic amplification ratio of the linear displacement of the driver piston (108), as it relates to the linear displacement of the amplifier piston (110), is inversely proportional to the surface area ratio of the driver piston (108) to the amplifier piston (110). Thus, small linear

displacement of the motor (100) is amplified to produce significantly greater linear displacement of the amplifier piston (110) (see column 5, lines 10-22 and Fig. 2).



Therefore, the claims would have been obvious for the reason that a particular known technique of amplifying the linear expansion of a piezoelectric motor was recognized as part of the ordinary capabilities to one of ordinary skill in the art.

Clarke does not disclose any specificity with regards to the type of fluid within the fluid chamber (112). However, Alexius teaches the expansion of a piezoelectric stack for urging against a large diameter piston, which in turn effects motion amplification by a smaller diameter piston through a non-compressible fluid (see column 1, lines 50-53).

It would be obvious to one of ordinary skill in the art to choose from a finite number of non-compressible fluids to be used as a medium in amplifying and transmitting the displacement of a piezoelectric member on to another element.

Claims 3-4, 10-11 and 17-18 are rejected under 35 U.S.C. 103 (a) as being unpatentable over applicant's own admissions.

It is stated within the applicants disclosure that the actuating electrical signals supplied to a piezoelectric element are in accordance with the specifications governing the particular piezoelectric element. (see paragraph 22).

[0022] The actuating electrical signals supplied to the piezoelectric element 22 are typically in accordance with specifications governing use of the piezoelectric element 22. Such actuating electrical signals comprise a series of voltage or...

Claims 5, 12 and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Maruyama U.S. 2001/0043864 A1.

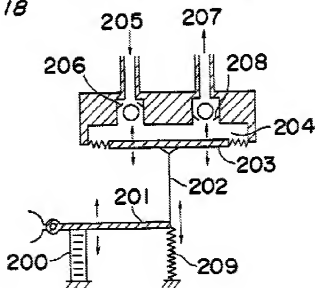
Maruyama teaches the use of a spring in order to carry out a restoring action of a diaphragm coupled to a piezoelectric actuator (200). It can be visually seen that the displacement magnifying mechanism (201) is directly coupled to spring (209). Maruyama teaches that as the voltage is decreased, to the piezoelectric actuator, the mechanical extension also decreases allowing for the spring to return the magnifying mechanism downward in the direction of the retraction of the piezoelectric actuator (200). In the broadest interpretation of the claims it can be seen in Fig. 18 that the spring (209) is displaced between the displacement magnifying mechanism and a base

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or stopper which ultimately defines a range of displacement resulting in diaphragm (203), comparable to applicant's piston, to have a particular travel distance when reciprocated.

Therefore, the claims are rendered obvious, in that, it would be obvious to a person of ordinary skill in the art to utilize known techniques for the purpose of restricting the displacement of a piston to prevent over-travel as well as make use of a biasing element or spring in order to provide an aid in the reciprocation of a displacement member.

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Fig. 1B

Any inquiry concerning this communication or earlier communications from the examiner should be directed to ROCCO ITALIANO whose telephone number is (571)270-3761. The examiner can normally be reached on Mon - Fri (Alt Fri Off) 9-5 est..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Isabella can be reached on (571) 272-4749. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Rocco Italiano
Patent Examiner

/DAVID J ISABELLA/
Supervisory Patent Examiner, Art Unit 4156